CLAIMS

WHAT IS CLAIMED IS:

1. A battery-less backup power supply for a telephone of a type that incorporates control electronics requiring an external source of power greater than that available from the local loop of a Telco or PBX when the telephone is on-hook, comprising:

a capacitor having a first lead coupled to ground;

a circuit for charging the capacitor from at least one of the external power source and the local loop; and,

a circuit for coupling the charge of the capacitor to the control electronics of the telephone when the external power source is not functioning.

2. The backup power supply of claim 1, wherein the capacitor comprises an Electric Double Layer Capacitor ("EDLC").

3. The backup power supply of claim 1, wherein the charging circuit comprises:

a first diode having a first lead coupled to ground; and,

an electrical connection between the external power source and a second lead of the first diode and a second lead of the capacitor,

whereby the capacitor is charged to the lesser of the breakdown voltage of the first diode and the voltage of the external power source when the external power supply is functioning.

4. The backup power supply of claim 3, wherein the charging circuit further comprises:

a bridge rectifier having opposite first and second terminals coupled to the tip and ring signals of the local loop, a third terminal coupled to ground, and a fourth terminal having an output voltage connected through a resistor to the second lead of the first diode and the second lead of the capacitor,

whereby the capacitor is charged to the lesser of the output voltage of the resistor and the breakdown voltage of the first diode when the external power source is not functioning and the telephone is on-hook.

5. The backup power supply of claim 4, wherein the charging circuit further comprises:

the telephone control electronics having a microprocessor operable to output a Hold signal in response to a receipt thereby of a Hook signal that instructs the telephone to go off-hook;

a second diode having a first lead coupled to ground; and,

an electrically actuated hook switch having:

a first terminal coupled to the fourth terminal of the bridge rectifier;

a second terminal coupled to a second lead of the first diode and the second lead of the capacitor; and,

a third terminal operable to couple the voltage of the fourth terminal of the bridge rectifier to the second terminal of the hook switch in response to a receipt thereby of the Hold signal from the microprocessor,

whereby the capacitor is charged to the lesser of the voltage of the fourth terminal of the rectifier bridge and the breakdown voltage of the second diode when the external power source is not functioning and the telephone is off-hook.

6. The backup power supply of claim 5, wherein the circuit for coupling the charge of the capacitor to the control electronics of the telephone comprises:

an electrically actuated hold switch having:

a first terminal coupled to the second lead of the capacitor;

a second terminal coupled to a power supply bus of the microprocessor; and,

a third terminal coupled to ground and a Hold signal output terminal of the microprocessor and operable to couple the voltage of the second lead of the capacitor to the power supply bus of the microprocessor in response to a receipt thereby of the Hold signal; and,

a manually actuated switchhook operable to couple the voltage of the second lead of the capacitor to a Hook signal input terminal of the microprocessor and the third terminal of the hold switch when actuated,

whereby the telephone can be manually instructed to go off-hook for placing or receiving a call when the external power source is not functioning.

7. The backup power supply of claim 6, wherein the circuit for coupling the charge of the capacitor to the control electronics of the telephone further comprises:

a ring detector coupled to the fourth terminal of the bridge rectifier and operable upon detection of a ring signal thereon to apply a Ring Detect signal to a Ring Detect signal input terminal of the microprocessor and to couple the voltage of the fourth terminal of the bridge rectifier to the third terminal of the Hold switch,

whereby the telephone can be programmed to automatically go off-hook for receiving a call without local human participation and when the external power source is not functioning.

8. The backup power supply of claim 7, wherein the microprocessor is programmable to actuate one or more relays in response to instructions received via an incoming call.

9. The backup power supply of claim 7, wherein the microprocessor is programmable to receive and store data or programming instructions received via an incoming call.

10. The backup power supply of claim 5, wherein at least one of the first and second diodes comprises a Zener diode.

11. The backup power supply of claim 6, wherein at least one of the electrically actuated hook and hold switches comprises a CMOS switch.

12. A battery-less backup power supply for a telephone of a type that incorporates control electronics requiring an external source of power greater than that available from the service loop of a Telco or PBX when the telephone is on-hook, comprising:

a capacitor having a first lead coupled to ground;

a first diode having a first lead coupled to ground;

an electrical connection between the external power source and a second lead of the first diode and a second lead of the capacitor;

a bridge rectifier having opposite first and second terminals coupled to the tip and ring signals of the local loop, a third terminal coupled to ground, and a fourth terminal having an output voltage connected through a resistor to the second lead of the first diode and the second lead of the capacitor;

a microprocessor operable to output a Hold signal in response to a receipt thereby of a Hook signal that instructs the telephone to go off-hook;

a second diode having a first lead connected to ground;

an electrically actuated hook switch having a first terminal coupled to the fourth terminal of the bridge rectifier, a second terminal coupled to a second lead of the first diode and the second lead of the capacitor, and a third terminal operable to couple the voltage of the fourth terminal of the bridge rectifier to the second terminal of the hook switch in response to a receipt thereby of the Hold signal from the microprocessor;

an electrically actuated hold switch having a first terminal coupled to the second lead of the capacitor, a second terminal coupled to a power supply bus of the microprocessor, and a third terminal coupled to ground and a Hold signal output terminal of the microprocessor, and operable to couple the voltage of the second lead of the capacitor to the power supply bus of the microprocessor in response to a receipt thereby of the Hold signal;

a manually actuated switchhook operable to couple the voltage of the second lead of the capacitor to a Hook signal input terminal of the microprocessor and the third terminal of the hold switch when actuated; and,

a ring detector coupled to the fourth terminal of the bridge rectifier and operable upon detection of a ring signal thereon to apply a Ring Detect signal to a Ring Detect signal input terminal of the microprocessor and to couple the voltage of the fourth terminal of the bridge rectifier to the third terminal of the Hold switch.

13. The backup power supply of claim 12, wherein the capacitor comprises an Electric Double Layer Capacitor ("EDLC").

14. The backup power supply of claim 12, wherein the microprocessor is programmable to actuate one or more relays in response to instructions received via an incoming call.

15. The backup power supply of claim 12, wherein the microprocessor is programmable to receive and store data or programming instructions received via an incoming call.

16. The backup power supply of claim 12, wherein at least one of the first and second diodes comprises a Zener diode.

17. The backup power supply of claim 11, wherein at least one of the electronically actuated hook and hold switches comprises a CMOS switch.

18. A method for providing backup power to a telephone of a type that incorporates control electronics requiring an external source of power greater than that available from the service loop of a Telco or PBX when the telephone is on-hook without using batteries, the method comprising:

providing a battery-less backup power supply in accordance with claim 1 in the telephone;

charging the capacitor of the backup power supply from at least one of the external power source and the local loop; and,

coupling the charge of the capacitor to the control electronics of the telephone when the external power source is not functioning such that the telephone is capable of at least placing and receiving calls.

19. The method of claim 18, wherein charging the capacitor comprises charging the capacitor from the local loop when the external power source is not functioning and the telephone is off-hook.

20. The method of claim 18, wherein charging the capacitor comprises charging the capacitor from the local loop when the external power source is not functioning and the telephone is on-hook.